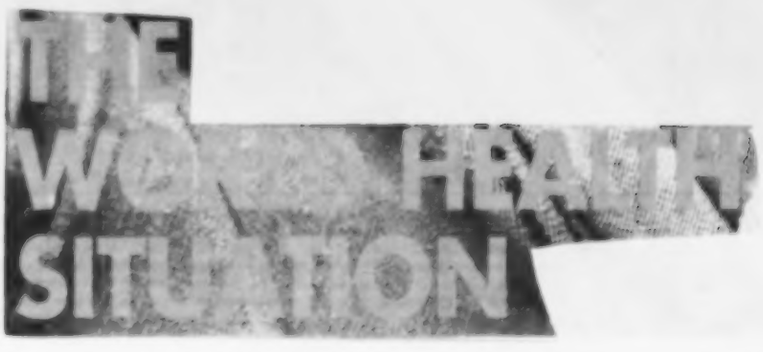
WORLD HEALTH

THE MAGAZINE OF THE WORLD HEALTH ORGANIZATION

46TH YEAR, NO. 3, MAY–JUNE 1993



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World Health ■ 46th Year, No. 3
May–June 1993
IX ISSN 0043-8502

Correspondence should be addressed to the Editor, World Health Magazine, World Health Organization, CH-1211 Geneva 27, Switzerland, or directly to authors, whose addresses are given at the end of each article. For subscriptions, see order form on page 31.

World Health is the official illustrated magazine of the World Health Organization. It appears six times a year in English, French, Russian and Spanish, and four times a year in Arabic and Farsi. The Arabic edition is available from WHO's Regional Office for the Eastern Mediterranean, P.O. Box 1517, Alexandria 21511, Egypt. The Farsi edition is obtainable from the Public Health Committee, Iran University Press, 85 Park Avenue, Tehran 15875-4748, Iran. The Russian edition can be obtained from "Medicina" Publishing House, Petrovsky per., 6/8, 101000 Moscow, Russian Federation.

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Editorial

The state of the world's health

Concerned at the widening disparities in health status among developing countries, the World Health Assembly decided in 1977 that the main social target of governments and WHO in the coming decades should be the attainment by all the citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life. This is popularly known as "health for all by the year 2000".

A fundamental principle in the health-for-all philosophy is that participation in planning and decision-making is an important process enabling individuals and families to contribute to their own development and to that of the communities in which they live, work and socialize. If, by the year 2000, **all** people in **all** countries are to have a minimum basic level of health, **all** people must become active participants. They must be in charge, rather than being passive recipients of the consequences of other people's decisions and of their perceptions concerning the development of the health system infrastructure and the planning and delivery of primary health care.

The health system should be consonant with each community's political, cultural and administrative traditions. Existing mechanisms may already be appropriate, or new ones may be created, so that people can express their views concerning what they see as priority health problems and make their own decisions about the best ways of solving them.

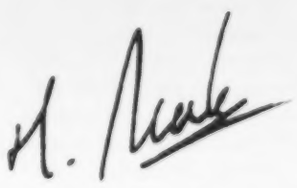
*If, by the year 2000, **all** people in **all** countries are to have a minimum basic level of health, **all** people must become active participants.*

Everyone should be in a position to control primary health care in the community, and to participate in controlling other levels of the health system.

In order to do this, people must be well informed. No people-oriented strategy is worth its name unless the people understand the reasons for it and have a say in how it should be applied, its scope and content, and its requirements and implications. The slow but steady progress towards health for all is regularly monitored and evaluated. The findings are made known to all interested parties, such as policy-makers and planners in the health and health-related sectors, health professionals, nongovernmental organizations, international and bilateral agencies involved in health development, and – above all – the **general public.**

Dr Hiroshi Nakajima, Director-General of the World Health Organization.

World Health is playing its part in this dissemination of information. The present issue concentrates on some major aspects of the findings from an evaluation carried out by Member States of WHO in 1991, about ten years after the Global Strategy for Health for All by the Year 2000 was adopted. While there has been progress towards reaching the social target set for the year 2000, the pace has not been even. If that progress is to accelerate, all of us must join together, using all our resources of knowledge, experience and will. ■



Hiroshi Nakajima, M.D., Ph.D.

Taking the world's pulse: the WHO report

"We cannot continue doing what we have always done. Tomorrow cannot be just more of yesterday. We need flexibility and pragmatism as much as innovation, but the stress must invariably be on action".

Since the previous WHO report (1987), the AIDS toll has soared to reach a cumulative 2.5 million cases worldwide in men, women and children.

In its *Eighth report on the world health situation*, WHO provides a striking overview of patterns and trends in health across the planet and assesses the achievements in the global fight against diseases. Covering the period 1985–90, the 178-page publication says that the situation leaves no room for complacency: "Tropical diseases seem to have gone on a rampage, with cholera spreading to the Americas for the first time this century, yellow fever and dengue epidemics affecting even greater numbers, and the malaria situation deteriorating . . .

"The AIDS pandemic is spreading globally . . . pulmonary tuberculosis is on the increase, partly stimulated by combined infection with human immunodeficiency virus (HIV). In the developing world, the number of cancer cases has for the first time overtaken that in the developed countries. Diabetes is increasing everywhere".

The report does, however, contain some good news: certain childhood diseases – measles, poliomyelitis, pertussis (whooping cough) and neonatal tetanus – are decreasing owing to a rapid increase in coverage by immunization programmes. Cardiovascular diseases in developed countries (except those in eastern Europe) are on the wane thanks to the spread of health education and promotion. Infant and child mortality rates, and the overall death rate, are continuing to decrease globally, and life expectancy is increasing worldwide.

But these advances are overshadowed by an "epidemiological transition" in which the poorest countries of the world, already burdened by communicable diseases such as AIDS, cholera, malaria and tuberculosis, are now also suffering from epidemics of diseases formerly regarded as mainly restricted to the industrialized nations, such as cancer, heart disease, stroke, and diabetes.

"The problems now being faced may not be susceptible to approaches that have been applied in the past", says Dr Hiroshi Nakajima, Director-General of WHO, in a preface to the report. "We cannot continue doing what we have always done. Tomorrow cannot be just more of yesterday. We need flexibility and pragmatism as much as innovation, but the stress must invariably be on action".

Among the report's main findings:

- Worldwide, *life expectancy* has increased by between one and two years over the past five years, with the global average currently at 65 years. Women outlive men by seven years in the developed countries, but by only two years in the least developed countries. In virtually all developed countries average life expectancy is now over 70 years. The majority of least developed countries still have a life expectancy below 50 years. However, there is a group of 18

developing countries – including Argentina, Cuba, Singapore and Sri Lanka – already enjoying a life expectancy of 70 years or more.

- As regards *infant and maternal deaths*, of the 140 million babies born each year, almost four million die within hours or days from perinatal causes. Over 500 000 women die each year from causes related to pregnancy and childbirth. A pregnant woman in sub-Saharan Africa is 75 times more likely to die compared with a pregnant woman in western Europe. In countries where the risk is highest, such as Somalia and the Gambia, the difference is 100-fold.
- Each year, some 50 million people die throughout the world, with 46.5 million deaths due to illness and disease. *Infectious and parasitic diseases* account for almost half of all deaths occurring in developing countries. Among the most common infections in the world are 1000 million infections with roundworms (*Ascaris*), 900 million with hookworm (*Ancylostoma*) and 500 million with whipworm (*Trichuris*). The protozoan parasite *Giardia lamblia* is distributed worldwide, affecting almost one in every three people.
- The goal of eradicating *dracunculiasis* or guinea-worm disease globally by 1995 will be achieved if national commitment to the programme is maintained. However, the *malaria* situation, far from improving, is in many places deteriorating compared with 10 years ago, and one-third of the world's population – 1700 million people – are at risk of developing *tuberculosis*.
- *Diarrhoeal diseases* remain a major cause of morbidity and mortality in infants and young children in developing countries. They cause 1500 million episodes of illness and more than three million deaths each year in children aged under five years. The seventh recorded cholera pandemic, after 30 years of westward spread from its origin in the Far East, reached the Americas at the beginning of 1991. A year later, cholera cases were recorded in 68 countries around the world. It is now feared that cholera may become endemic in Latin America and the Caribbean.
- *Acute respiratory infections* are estimated to be the first cause of childhood mortality in developing countries. Each year they claim 4.3 million lives of children under the age of five.
- *Sexually transmitted diseases* (STDs) continue to be among the most frequent infectious conditions worldwide. In addition to the 250 million cases of major STDs, over one million people a year are newly infected with *HIV, the virus that causes AIDS*, and this number is increasing. Up to mid-1991, at least 8 to 10 million HIV infections have occurred in adults since the beginning of the pandemic, and about one million children have been born infected with HIV.
- Every year about seven million new *cancer* cases occur, half of them in developing countries. Currently, there are about 14 million cancer patients, roughly two-thirds of them terminal cases. Cancer incidence is expected to rise practically everywhere, the main reasons being tobacco use and, paradoxically, better health care – people live longer, therefore they stand a greater chance of developing cancer. Two-thirds of all cancers are attributable to life-style and the environment. At least one-third of all cancer cases are preventable. ■

A copy of the report can be ordered from Distribution and Sales, WHO, 1211 Geneva 27, Switzerland (tel. 41 22 791 2473; fax 41 22 788 0401), price 35 Swiss francs, 24 50 Swiss francs for developing countries.

Keeping cholera at bay

Luis A. Loyola & Patricio Hevia

The cholera epidemic which broke out in Peru in January 1991 was part of the seventh pandemic of this disease that started in Indonesia in 1961. From Peru it has gradually spread to almost all the countries of Latin America, highlighting the lack of safe drinking-water and basic sanitation services, malnutrition, poverty and overcrowding in slum areas. It has cost Peru dearly in economic terms through the loss of foreign trade and tourism, but also through the cost of medical care and disputes between different sectors.

In order to cope with this situation, action was needed in many different fields – the environment, organization of health services, epidemiological surveillance, education, social communication, the economy, housing and building, and even fishing. In this effort the government authorities and the community succeeded in joining forces, since it was essential for their strategy to be intersectoral in its approach and to involve the participation of ordinary people.

There have been many positive examples of intersectoral activities carried out with active community participation. Invariably the people's initiatives proved to be the central factor in achieving effective and rational use of resources and successful protection of health. The communal oral rehydration centres, where health promoters and locally trained members of the community offer health care are obvious examples of this vital process of working together.

Peru in 1991: cholera broke out and came to stay. A victim receives intravenous rehydration

A slum settlement in Peru – at high risk from the recent cholera epidemic – involved all sectors in the community in a defensive plan which succeeded in keeping fatal cases to a minimum.

Slum settlements

A typical experience of intersectoral and organized community involvement can be seen in the district of Chorrillos, in the health subregion of Lima South. Once a quiet fishing creek and beach resort for the wealthy, Chorrillos was completely changed by the continual influx of migrants heading towards the capital from the mountainous and poverty-stricken countryside. They gradually occupied the area, creating more than 60 urban slum settlements known in Peru as "pueblos jóvenes" (young towns). More than 70% of the population of roughly 250 000 live today in these fringe areas – thousands of families with scanty economic resources and a variety of cultural backgrounds. Competition for land, the need for health care, and the struggle to improve their lot, indeed just to survive, have led to their setting up grass-roots organizations, such as soup kitchens, committees for free distribution of milk, mothers' clubs, social welfare associations, youth groups and fishermen's associations, and these in turn have provided opportunities to discuss how to put social and political matters into practice.

In August 1990, what was known in Peru as the "economic shock" caused much hardship. In Chorrillos it led to the formation of a district committee on social emergencies, including representatives of local government, the health and education authorities, the Catholic Church, grass-roots social organizations and nongovernmental organizations. Four successive area meetings on health took place, culminating at the end of 1990 in a workshop entitled "Towards a District Health Plan for Chorrillos".

at which the community itself identified its health needs and ranked them in order of importance. Thus the scene was set and the actors were in place when the cholera epidemic broke out at the end of January 1991.

As soon as the scale of the danger threatening everyone, but especially the poorest, was realized, a Cholera Control Command was established, involving all the various intersectoral organizations committed to carrying out the district health plan. This Command never lost touch with its community base or with the multisectoral organizations active in the district. In fact, it spurred the community to move even faster towards a district health system.

October 1991 saw the start of an intersectoral project with community participation, supported by the Ministry of Health of Peru and with technical cooperation from the Pan American Health Organization as well as financial cooperation from the government of Italy. Known as the Project on Health, Environment and the Fight Against Poverty (SMALP), it was launched through the combined efforts of all these parties and, although it reflects their own interests and conflicts, it nevertheless has great potential for success against a background of instability and uncertainty.

Health for those at risk

The general objective was to help to improve the health status, environment, and welfare of high-risk groups through the development and consolidation of the Chorrillos district health system. By agreement, responsibilities were shared among the different social and health partners, and overall leadership was assumed by the Ministry of Health at the district level.

Chorrillos now has a network of health services comprising seven health centres and 11 health posts under the authority of the Territorial Health Unit of the Ministry of Health. These provide coverage at the local level through community health workers who include traditional birth attendants, health promoters, facilitators and communicators.

Demonstration of how to chlorinate water to avoid infection

Before the expected flare-up of cholera in the summer months (December 1991 to March 1992), the SMALP project helped to organize four events at the local level (each in the catchment area of one of the health centres), and a meeting at district level attended by representatives of the community, at which new plans and proposals were discussed and finalized. These sought to transform conventional health services programming into a catalytic process for encouraging new ideas and involving local social groups in joint decisions on the management of the health services, with a view to improving specific health conditions. The four preferred lines of action were: strengthening the health services' capacity for response; environmental sanitation; training; and social mobilization.

With respect to cholera, the following activities were regarded as priorities:

- establishment of surveillance committees;
- starting a community fund for cholera prevention;
- imposing fines for dumping garbage;
- training in environmental sanitation and food handling;
- organization of mass campaigns of social communication;
- making an approach to Petro-Peru to obtain fuel to boil water.

Do's and don'ts

Insistent messages in the mass media have informed families what they should and should not do. They have forcefully recommended boiling water, taking care with food, hand-washing and the proper disposal of waste and excreta. The use of the *caserito*, or plastic water container with a tap at the bottom, has become popular in families and among street-vendors of food. The Ministry of Health has sent the district enough chlorination tablets to purify two million litres of water. Certain other districts have tried to ban street-vendors of food, but this proved impossible as it is difficult to find alternative work for these people, who have no skills and depend on their sales for survival.

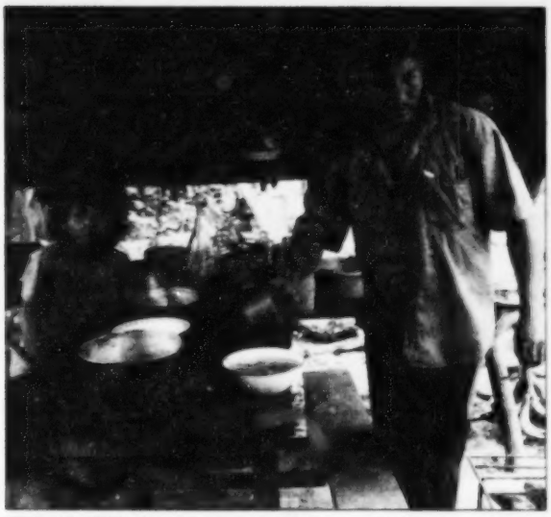
Training workshops on cholera prevention have been arranged for people who handle food and for teachers. There are now 134 communal oral rehydration centres, staffed by trained volunteers. The soup kitchens and community education centres have received guidance about cholera control, such

as monitoring and improving water quality, controlling insects, rodents and bacteria, disposal of excreta, and health education, with joint participation from the education sector, the churches, the municipality and the health authorities. Instructions on the management of clinical cases were quickly passed on to medical and paramedical personnel, with courses for laboratory technicians, nursing auxiliaries, social workers, nurses and doctors on how to manage patients admitted to hospital and the use of appropriate solutions and oral rehydration salts. These courses proved amazingly popular.

The Chorrillos district health unit reported 711 cases in 1991 and 753 in 1992, very low totals which illustrate the effectiveness of all the measures taken. Community involvement and the intersectoral approach were vital factors in keeping case fatalities at an extremely low level in this chronically poor district. The project proved to be a novel experience which is still evolving as more progress is made. It brought together people who often worked against each other in the past, but who have now found common ground for working together for the health of Chorrillos.

The trial-and-error nature of this process, without ever losing sight of its goal, shows the way forward where no ready-made solutions exist. Strategic surveillance is therefore essential, since permanent monitoring and evaluation are the only way to keep on course and at the same time to reap the benefits of experience. ■

Dr Luis A. Loyola is the PAHO/WHO Representative in Peru, Oficina Sanitaria Panamericana, Casilla 2117, Lima 100. Dr Patricio Hevia is Adviser in Development of Health Services, Los Cedros 269, San Isidro, Lima, Peru.



Preparing oral rehydration solution

Fish can be a source of contamination when eaten raw

Cholera in Peru

On 23 January 1991 the first case of cholera in Peru was reported in the province of Chancay, in the district of Chancaillo, 80 km from Lima. The epidemic spread rapidly, especially in the rural and urban slum areas, challenging the people's capacity for response even as they faced the starkest social and economic crisis in their history. The hard-hit health services could count only on the legendary dedication of their human resources, who nobly rallied to cope with the worst epidemic ever to hit the country.

The health sector was aware that it could not handle the epidemic unaided, so it decided to set up multisectoral committees for cholera control with representation from all sectors (education, agriculture, the armed forces, local government and grass-roots organizations). Each committee was charged with reaching consensus decisions appropriate to each region and helping to put them into effect, trying to ensure that cases were treated and the epidemiological cycle of infection was interrupted as quickly as possible to prevent further cases.

This experience has taught Peruvians that responsibility for health does not lie with one sector alone but with the entire population. Today, two years after the epidemic, the concept of health and the involvement of society as a whole is more important than ever, and there is real participation in preventive activities. In fact, cholera has awakened the country to the enormous potential of the community and has succeeded in involving the whole population in health-related tasks. Community health workers are the unsung heroes who have shown the world how Peru attained the lowest case-fatality rate in the country's worst epidemic.

Dr Carlos Moreno Chacon
Director-General of Health Services,
Ministry of Health, Avenida Salaverry, Lima, Peru.

The super-aged society

Shigeaki Baba

In contrast to the social concepts of the elderly in the past, a new prototype seems to be emerging – that of the "New Elderly". No other age group is subject to so wide a variation in their individual physical and financial conditions, and accordingly in their needs and requirements for social services and facilities.

Aging is fast becoming a major social problem in Japan. In the last four decades, life expectancy has risen from 63.9 years to 78.7 years (from 65.9 to 81.6 years for women and from 62.1 to 75.9 years for men). The total population, which was 123.61 million in 1990, is expected to reach 128.64 million in 2007, and by 2025 the numbers aged 65 or older will exceed 20% of the total population, reaching 27.3% and perhaps a staggering total of 33.2 million. This means that there will be more than twice as many aged as in 1990, and that Japan will have a vast elderly population on a scale unparalleled by any other nation in history. Professor Naohiro Ogawa of Nihon University Centre for Population Study reported that, according to his projected estimates, by 2025 the number of the bedridden old will increase to about 2.8 times that of 1990, and those affected by senility will be 3.2 times more numerous.

Starting in the 1990s, the Ministry of Health and Welfare has moved into action with its strategic ten-year Plan for the Aged, focusing on improving and expanding the number of welfare institutions for the elderly as well as providing funding and assistance for nursing at home. However, the numbers of aged in need of care are increasing rapidly, and an urgent demand has arisen for establishing community systems and systems for mutual help among the elderly.

The overwhelming numbers of the elderly are also bound to impose a financial burden on society, with expected increases in national medical expenditure and in individual national pension payments. Consequently there are voices in the government urging drastic reforms to the present social security system. Thus, improvements in the life-style of each and every member of Japanese society are now a responsibility of the government, as well as of the people.

Quality of life

Widespread interest in health and well-being characterizes this aging society. Along with activities for fitness and newly developed approaches to the health concept, which are centred more on the role and outlook of the individual, various measures have been taken to encourage improved life-styles for each age group. This approach of examining the quality of life according to people's age groups and their stage in the life-cycle is a recent trend in the area of social philosophy, and is a basic component in

establishing healthy, wholesome life-styles as well as the prevention and control of diseases.

However, what is all very well in theory is not so easy to put into practice. For instance, an essential prerequisite to prevent illness and promote well-being is cutting out the smoking habit. Yet Japan's statistics indicate that 74.7% of men and 14.2% of women are smokers. The highest proportion of smokers are among men in their 30s and women in their 20s, while the lowest are among males and females in their 70s or older. The wide difference between the sexes in respect of smoking is a particularly Japanese characteristic.

Furthermore, as many as 2.2 million Japanese are estimated to be dependent on alcohol. According to a 1985 Japan-US joint survey, 76.5% of men and 24.6% of women in Japan were drinkers, the highest figures being 80.1% and 79.2% for men in their 30s and 40s, respectively. There was a similar high ratio among the other age groups for males. Among women, those in their 20s had the highest percentage of drinkers (36.2%). It would seem that steps should be taken to prevent possible risks to the health of newborn babies as a result of high alcohol consumption among these women – who are the ones most likely to become pregnant.

A nationwide survey of views and attitudes to health found that an overwhelming majority of the Japanese spend their leisure hours watching television or listening to the radio. Among the groups studied, 70% or more of men and women with pre-school children and 50% of those with primary school children spend their holidays with their families. The Japanese mostly live in nuclear families, and their family lives are centred around the children.

As for exercise and sports, there are differences between the sexes and between age groups. Women tend to discontinue their sports pursuits at a younger age than their male peers. Participation in sports has been found to correlate directly with interest in health, and the cultivation of sports from an early age is expected to foster awareness about fitness and well-being in the future.

A new prototype

In contrast to the social concepts of the elderly in the past, a new prototype seems to be emerging – that of the "New Elderly". No other age group is subject to so wide a variation in their individual physical and financial conditions, and accordingly in their needs and requirements for social services and facilities. As the majority of the population become older, in the coming super-aged society, separate consideration will have to be given to those who are fit and able to work, and others requiring nursing and care.

more and more women are joining the work force

Nutrition and diet in Japan have undergone great changes from the post-1945 era of near-starvation to the rich indolence of present affluence. As life-styles in housing, food and clothing have rapidly become westernized, and as society has progressed due to advances in science, the physical build of the Japanese and also the prevalence of noncommunicable diseases have approached those of Western people.

It is customary in Japan for women to be in charge of the kitchen, while men take a more passive role concerning what they eat. This tradition is an important health factor. Membership in various social and occupational groups also greatly affects eating patterns, while in recent years awareness of the effect of eating on health has been steadily growing. The irregular diet of the increasing numbers of elderly living alone is beginning to emerge as a major social problem.

The social environment is thus undergoing rapid change, with the increase in the numbers of working women, the build-up of population in urban areas, the inner city problems, the rise of the nuclear family, and the aging of society.

Care for the bedridden

The home-nursed or bedridden elderly and those suffering from senility are therefore urgently in need of active government policies and local assistance to ensure their rehabilitation and care, including the planning and construction of the necessary social infrastructure. Furthermore, preventive measures against such debilitating and chronic noncommunicable diseases as cancer, diabetes, atherosclerosis, cardiovascular diseases, rheumatism and osteoporosis are goals that need to be pursued though interdisciplinary efforts.

Medical surveys conducted on a wide scale will supply vital information on the incidence and prevalence of these noncommunicable diseases, suggest countermeasures, and make possible the evaluation of policies and economic support measures already taken. These are the foundation stones of disease prevention in an aging society. In step with these population-based medical surveys and monitoring, various regions have recently introduced computerized hospital systems and central databanks to maintain patient records.

Finally, basic community planning that promotes both regional cultural development and the individual's quality of life within the community is a truly vital basis for the strategic promotion of health and well-being. The health of each and every man and woman, at every stage of life, is an essential resource to ensure harmony for all on this planet and for the future of mankind. ■

Professor Shigeaki Baba is President of the Hyogo Medical Centre for Adults, 13-70 Kitaojicho, Akashi 673, Japan.

A provincial fund for health

Amida N. Ghogomu

Working initially in the field of essential drugs, the North-West Provincial Special Fund for Health in Cameroon has pioneered a system for providing quality health care to the population with the full collaboration of users at every level of planning, implementation and evaluation.

In the face of a persistent economic crisis and a constantly growing demand for health care, the Cameroon government has enshrined cost-sharing as a cardinal principle of its present health policy. The North-West Provincial Special Fund for Health is a signal example in sub-Saharan Africa of user participation, not only in health financing, but also in health management and policy formulation at all levels.

The Fund is a non-profit-making charity which was officially inaugurated by the Minister of Public Health on 24 April 1992. But its activities began in 1986 as the North-West Propharmacy Association, supplying essential drugs to a number of rural health centres. Its starting capital took the form of donations and technical assistance from the German Agency for Technical Cooperation (GTZ), and financial contributions and infrastructure from the Ministry of Public Health and local councils in the North-West Province.

In essence, the Fund's objectives are:

- to assist the Cameroon Ministry of Public Health in financing the establishment and functioning of health services and in monitoring health problems;
- to supply pharmaceutical products and materials to health units;
- to contribute towards improving the quality of health and the continuity of services in the province.

The mountainous terrain and very heavy rainfall make communication by road particularly difficult in the rainy season. Some 80% of the province's population of 1 300 000 live in the countryside and are engaged in agriculture and animal breeding. The people are very dynamic with a strong and long-standing spirit of communal cooperation for social advancement.

The province has been subdivided into 13 health districts, corresponding to the operational level, as well as 107 functional health areas and 37 proposed health areas. Members of the health area committees are elected by the villagers in each area, and in their turn these committees elect two members per area to form the district health committees. Each district committee elects two members to represent it at the general assembly of the Fund.

Managing the Fund

The management of the Fund is assured through a general assembly, a management committee, and the head office. The general assembly is a democratic structure representing the users, but also includes delegates from the Ministry of Public Health and the German government. It meets once a year to adopt policy and the budget.

The management committee (minimum of 12 members) is answerable to the general assembly and meets quarterly. The head office has a general manager with administrative and technical staff who manage the Fund on a day-to-day basis. The general manager is appointed by the Minister of Public Health.

Packaging drugs in Africa

The Fund is now independent of donor financing except for a grant from the Ministry of Public Health for the salaries of government employees seconded to the Fund, and from the German government for technical expertise and consultancies.

The main source of funding comes from the turnover of activities during each financial year, but another source is the so-called health centre or community fund generated from the activities of each health centre (deliveries, consultations, clinics, etc.), collected as users' fees. These can provide a monthly income of anything between 20 000 and 200 000 CFA francs per centre. Gifts and legacies from donors and resources accruing from investments are other sources of income.

Although the Fund has ambitious objectives, only the essential drugs department is functioning at present. A second department, a garage for the maintenance and repair of vehicles and technical medical hardware, is just beginning. Others will be created as the need arises.

Low cost – high quality

The essential drugs department assures the procurement from abroad and from national wholesalers of low-cost but high-quality essential drugs in their generic forms, and their redistribution to all pharmacies in the province. This centralized system reduces the running costs and prevents misappropriation and embezzlement.

From a large central warehouse at headquarters, drugs are supplied to the health centres on a regular basis. No secondary warehouses exist. Each health unit makes an order to last two to three months. Health posts are served by the pharmacy of the appropriate health unit. Uniform prices for each item are maintained at below the market prices in the private pharmacies. Vital supplies (oral rehydration salts, antituberculosis drugs, condoms and so forth) have a lower mark-up than medicines that are in popular demand.

The department now employs 45 persons, 15 at headquarters and 30 serving at the level of the health centres as pharmacy attendants. In addition the services of a computer specialist, a legal retainer and a port clearing agent are permanently solicited.

The careful choice, training and regular supervision of pharmacy attendants are major concerns. The person must have at least the level of a school-leaving certificate, reside in the health area, be morally sound, and be selected by the community to undergo two weeks of training before serving at the pharmacy. The knowledge of each pharmacy attendant is assessed and improved upon during a two-monthly supervision and supply tour by trained supervisors as well as during an annual refresher course. During the tours, the supervisors pay salaries and incentives to the attendants, control their records and prepare a report.

Renewed vitality

Starting in 1986 with only 56 pharmacies, the programme now serves 84 pharmacies in both urban and rural settings, covering about 84% of all health units. From health-centre-generated funds including the sale of drugs, public health activities at the grass roots have improved in both quality and quantity. Vaccination activities are sustained through the regular supply of kerosene for refrigerators. Laboratory reagents and minor equipment are regularly replenished, buildings are renovated, and technical equipment and other logistic materials are purchased and/or repaired.

At the health centre, each health team receives reorientation on the guiding principles and practices of the district system approach. As a result, public health establishments are regaining their vitality and the number of consultations is steadily increasing. For example, health centre attendance in December 1990 was 210% of the attendance in December 1986.

The Fund offers training facilities and performs external consultancies for other organizations in Cameroon and other African countries on the setting up and running of an essential drugs programme. In Cameroon, two other Provincial Funds are being set up on the North-West model.

In short, the Fund has satisfactorily assured the availability of essential drugs at health units – there are no shortages – and has improved the quality of health care by a judicious use of profits to reinforce health services. These two moves have resulted in an increased use of services.

Among the positive factors that have contributed to this success are:

- regular control and supervision;
- strong motivation of staff through training and retraining, and payment of performance bonuses and incentives to workers;
- careful choice of generic drugs of proven high quality; and
- such safety measures as anti-burglar bars and employment of night watchmen.

These last measures have been necessary because, with the persistent economic crisis and more workers being laid off, there has been increasing theft at the community pharmacy level. There have been other constraints, such as resistance on the part of some staff to prescribe in generic form. The economic crisis may reduce the purchasing power of the community, and competition with the formal and informal private pharmacies could cripple the system. Such a situation can be avoided by limiting sales to only high-quality and effective generic drugs, by improving the diagnostic and prescribing abilities of health centre staff, by constantly educating users on the advantages of generic drugs, and by maintaining selling prices below market level.

The Fund is a genuine Cameroon experiment to find a system for providing quality health care to the population with the full collaboration of users at every level of planning, implementation and evaluation. In its pioneering role, the Fund has proved itself a practical instrument within the framework of primary health care for mobilizing community resources and activating participation at the local level. ■

Dr Amida N. Gbogoma is Provincial Delegate of Public Health, B.P. 452, Bamenda, North-West Province, Cameroon, and Chairperson of the Management Committee of the North-West Provincial Special Fund for Health.

Essential drugs can treat most of the infectious and parasitic diseases that ravage African countries.

Dr Sabin's legacy to the world

Jaime Sepúlveda

Dr Albert Bruce Sabin, who perfected the first viable live vaccine against polio.

Poliomyelitis has been eradicated from the Americas and other areas, and is expected to be eliminated from the world by 1995. This outstanding achievement has been made possible thanks to the availability of an excellent vaccine coupled with successful vaccination programmes. Few actions in public health have become so deservedly prestigious as the vaccination campaigns.

The first major achievement of the immunization effort was the eradication from the world of smallpox in the late 1970s. But the success with smallpox is only the most visible component of all the many benefits conferred by immunization programmes worldwide. Not only have they brought about the survival of children who would otherwise have died; they have greatly enhanced the quality of life itself.

Poliomyelitis acquired epidemic proportions in the Americas at the end of the last century, mainly in the most developed regions. In Mexico, the first epidemic outbreaks started in the 1940s and caused many victims. The oral poliovaccine was made available in Mexico in the early 1960s. Coverage was low then, and mainly concentrated among well-to-do children. In the 1970s, a new national programme reached much greater numbers of children and poliomyelitis cases began to drop.

However, it was not until 1985 that a new polio immunization initiative took place, with the goal of reaching all children, regardless of social status or geographic location. This new strategy, focusing on "National Vaccination Days", was originally proposed by Professor Albert Sabin, the US scientist who developed the oral poliomyelitis vaccine. Here the idea was to "flood" the environment

While this article was going to press, the news that Dr Albert Sabin – discoverer of the "live" oral poliovaccine – had died, on 3 March, overwhelmed the scientific world. This article is dedicated to the memory of a man whose contribution to a better quality of life for all mankind will never be forgotten.

Polio vaccination campaign in the Yucatan peninsula of Mexico.

with the attenuated poliovirus from the vaccine – by immunizing all children in one single day – thus replacing the wild virus that produces disease.

The most salient attributes of good vaccines are twofold: their effects are both immediate and permanent. In addition to these, the poliomyelitis vaccine has the outstanding merits of being easily applicable (two oral drops) at a low cost, and of being very well accepted by the population. The impact of vaccines is not measured only by the immunological defence provided to the individual but also in terms of the immunity created in brothers, sisters and other relatives, better known as "herd immunity". Again, this is a peculiar attribute of the oral poliovaccine.

An ambitious enterprise

In 1991, a turning point in public health occurred as a result of the pledges made at the Children's Summit held in New York, where heads of state and government representatives promised their support to the goal of a Universal Vaccination Programme. Such an ambitious enterprise created doubts about its feasibility among pessimists. Mexico set itself the goal of full vaccination of all children aged under five by October 1992. We had previously had the positive experience of several years when we vaccinated over 95% of pre-school children on each of the two annual "National Vaccination Days".

Those who were sceptical about this goal of the Summit had some reason to be so. In a large country like Mexico, there are huge numbers of children hailing from all kinds of social and cultural backgrounds, and a high proportion are widely dispersed in more than 100 000 localities with fewer than 500 inhabitants. However, the potential synergism of strong political will, unstinting financial support and firm leadership had not been properly acknowledged. The country's President called upon all political leaders, the medical community and society at large to join the initiative. Community participation was remarkable; for each one of the National Days – 13 by now – more than 80 000 vaccination posts were established, with the involvement of about 600 000 volunteers.

Public health is about equity and social justice. Even though Health for All by the year 2000 remains more a desirable than a reachable goal in most aspects, progress has been made in many areas. Vaccination is one real intervention that makes all children immunologically equal – provided they are not critically undernourished – regardless of sex, race and social status.

In countries like Mexico, where aiming to bring about higher levels of social justice is both a necessity and a government priority, the universal vaccination programme is seen as a structural element to reduce the inequities of underdevelopment. Our national epidemiological profile, which combines diseases of both the pre-industrialized and industrialized world, obliges us to give priority to those health problems that are the most frequent, serious and vulnerable

This young mother in Chiapas, Mexico, makes sure that her daughter receives the full course of polio vaccination.

to interventions. Of all public health actions, immunization and oral rehydration therapy are undoubtedly the most beneficial in terms of costs.

Many side-benefits

There are many other side-benefits from the polio and other vaccines. The visible results give a boost to the overall credibility of health institutions. The success of vaccination campaigns permits the introduction of other primary health care interventions. Oral rehydration therapy, vitamin-A supplementation and family planning information are now routinely supplied along with the vaccines.

The health volunteer has come a long way to this isolated farm. The polio vaccine has been kept cool and potent in an icebox.

Young villagers wave their certificates proving that the health worker has completed their vaccination.

There are people within public health institutions, as well as in donor agencies, who have the erroneous notion that vertical programmes such as immunization interfere with the concept of primary health care and its horizontal integration. This has resulted in endless debates about vertical versus horizontal programmes. But it is a false dilemma; we have seen that immunizing children has a spill-over effect into other health programmes. It promotes the coordination of health institutions to the point where they handle resources and responsibilities in a more efficient manner. The process is empowered by training health personnel, promoters and community volunteers; this experience is reflected in turn in the improved organization and operation of other primary health activities. The infrastructure and resources supplied to the vaccination programme have improved the physical capacity of the health centres. All these by-products increase the popular demand for other health services, and the overall coverage of preventive programmes.

Some donor agencies are still not fully convinced of the merits of the global poliomyelitis eradication effort. Their logic is that there are other vaccine-preventable diseases, such as measles, that kill far more children. However, we believe that we should establish priorities so as to start with the most easily accomplishable of the challenges facing us. In addition, poliomyelitis has already been eradicated from whole regions of the world using one single, successful strategy. We must pursue this effort in the rest of the world in order to claim one more victory over disease. No more dramatic scenes of children tied up to orthopaedic apparatus or on crutches. Thank you, Dr Sabin. ■

Dr Jaime Sepúlveda is Vice-Minister of Health of Mexico, Ministry of Health, Liga 7, 1er Piso, Col Juárez, Mexico, DF, 066960 Mexico.

Broadening the market for health care

Tim Ensor

No nation can afford to cut back the resources it devotes to health

Two issues dominate health system reform throughout the world: How much should be devoted to health care? And how can resources be managed to achieve maximum health gains – taking due account of the need for improved equity?

The last two years have seen the introduction of perhaps the most far-reaching reform of the National Health Service (NHS) in the United Kingdom since it was first established in 1948. Although the notion of an "internal market" has been proposed, or put into effect in other countries (Netherlands, New Zealand, Sweden), the changes in the UK have been the most radical both in the speed of change – a little over two years after publication of the government's document heralding the move – and in the extent of the shift away from an integrated model in which the government plays roles of both the funding agency and the service provider. Despite these changes, the *source* of funding – general taxation – remains the same, even though questions may be raised in the future about the suitability and level of funding.

Prior to 1991, resources for hospital and community health care were allocated to district health authorities (DHAs) on the basis of population size, taking into account health needs and some other local factors. The district authority had responsibility for managing and paying the providers of care on the basis of bed capacity, and of past and projected utilization levels. Since 1991 the relationship between DHAs and providers has changed, and today hospitals and other providers – such as ambulance services – are permitted to become self-governing trusts. Although still owned by the NHS, they are no longer managed by the DHA and have substantial autonomy over decisions on personnel employed, salary structure, use of facilities and specialities offered. The payment or purchasing, and service-providing roles of the DHA have been substantially separated.

Better health status

The purchasing side of the DHA is charged with using its budget to maximize the health status of the population. In order to achieve this, it may contract with any provider on the basis of the cost and quality of services offered. Providers need not be local district NHS facilities; they might be private hospitals or NHS facilities in other districts. Contracts are agreed with providers before the beginning of the financial year, and may simply specify the service to be provided for a target population, or they may go into detail about the cost and volume of the service.

A new method of managing capital spending has also accompanied the reforms. Health service providers must now pay a capital charge based on the value of their physical assets.

A major effect of the internal market on health service purchasing patterns is that city centres, particularly London, will tend to lose out because of their higher capital and operating costs. Health authorities will prefer to contract with provincial hospitals which can offer an equivalent service at much lower cost. Now that purchasers are free to choose among providers, the higher capital charges in city centres are making the provision of hospital services in those areas look increasingly unattractive. This has given fresh impetus for hospital closures or mergers. Although unpopular to many people, the reforms may succeed in bringing about some long-needed rationalization of London's hospital service. But concern has been expressed that, if a reduction in accident and emergency facilities is not accompanied by an improvement in primary health care, the population will suffer.

Ensuring quality of care

In order to ensure that the internal market improves the efficiency of health care provision, two issues are important: the availability of information on the costs, consequences and quality of treatments; and the adequacy of competition between providers.

Internal markets depend on information. Information is required not just on treatment costs but also on the quality of service if provision is not to be judged on price alone. Although considerable investment in information technology has already been made, the contracting process is still at a relatively rudimentary stage. The cost of introducing the new procedures has been substantial and there are claims that wastage has occurred.

Although the operation of a contracts system is new for secondary health care, i.e., referral centres and larger hospitals, this has always been the case in the primary care sector, with independent doctors in general practice contracted by the Family Practitioner Committee (now the Family Health Services Authority), on the basis of capitation (annual fee per patient) and an experience-related practice allowance. Since 1990 the proportion of general practitioners' income received through capitation has increased. The main check on the quality of service is the patient's freedom of choice of general practitioner. But this is only effective where there is a wide choice of practitioners so that the patient can identify those who provide the best service. A lack of competition in some areas, or a tendency for patients to judge doctors on non-medical attributes (such as quality of the waiting room), may mean that the clinical elements of quality of care are neglected.

In the case of secondary health care, the problems of competition are heightened because of the relatively small number of service providers. The purchasing authority (DHA) may have no real choice among providers. This problem, together with the large amount of costly information required, could render the "contract" model unable to ensure satisfactory provision in some areas.

Internal markets may make budget constraints more explicit. At present the main rationing device in Britain is the hospital waiting list. There are long waiting lists for some procedures, and these encourage patients who can afford it to seek treatment in the private sector. Some districts are beginning to experiment with methods of prioritizing treatment procedures such as differences in the cost per QALY (Quality-Adjusted Life Year). These allow a rough comparison of the health status gain per unit of expenditure. One scenario is that treatment provided by districts is restricted to a specific package of services that exclude procedures that are too expensive or of dubious effectiveness.

Bringing health care to the home

Such pressures as these are heightened by continued suggestions that the increase in funding is not sufficient to cover the needs of a growing elderly population and the increasing cost of medical technology. Although real funding has steadily increased in recent years, current pressures to restrain growth in public expenditure make further substantial increases in funding from central taxation unlikely. Future options for increasing the level of supplementary funding may include higher patient charges for non-medical services and voluntary insurance for non-core NHS services and referrals of private patients. While a more fundamental review of the way in which the National Health Service is funded at present appears improbable, debate on alternative funding mechanisms could be revived if strong budgetary pressures continue. ■

Dr Tim Ensor is research fellow at the Centre for Health Economics, University of York, York YO1 5DD, England.

Safe water – better health

Christopher Gunapala Uragoda

The profile of water-related diseases in Sri Lanka is encouraging, but there is still room for improvement; achieving the goal of "water for all by the year 2000" should have the desired impact on these diseases.

The health status in Sri Lanka, as measured by the usual parameters, has improved considerably during the past few years. Some of the latest available figures, which illustrate this progress, are an infant mortality rate of 17.5 per 1000 (1989), a maternal mortality rate of 0.4 per 1000 (1987), and life expectancy of 67.8 years for males and 71.7 for females (1981). One of the factors responsible for this improvement is the provision of a safe water supply to a large segment of the population.

Sri Lanka depends heavily on rainfall for both agriculture and power. Water is specially precious in the dry zone, which covers nearly half the country and receives rains for only three months of the year during the north-east monsoon. On the other hand, the wet zone is generously provided with water twice a year from two separate monsoons.

The ancient kings of Sri Lanka left behind the legacy of a sophisticated hydraulic system which is still operational today. They created reservoirs or tanks in the dry zone, where water was impounded by building dams across rivers. Constructed primarily for irrigation of rice fields, the system channelled water serially from a large tank into a smaller one and then into a yet smaller one, till the smallest unit of a village tank was reached.

Some of the remote villages scattered over the dry zone still use their own little tank as the community water supply. This was invariably fouled by people who bathed and washed in it, and by cattle which drank from it and wallowed in it. The health of the little village community to a large extent depended on the quality of its water. It was to blame not only for the spread of water-borne diseases but also for other conditions such as parangi or yaws, an infectious disease similar to syphilis but of non-venereal origin, which used to ravage small hamlets, especially in the dry zone. The complete eradication of this scourge since the advent of penicillin was a major triumph of the health service, for together with malaria it impeded economic development of the affected areas.

Success of the decade

The United Nations' International Drinking Water Supply and Sanitation Decade (1981–1990) acted as a catalyst in promoting measures to improve the supply of safe water and drainage in Sri Lanka, where 80% of the population live in the rural sector. In 1981, at the beginning of the Decade, only 54% of the then population of 14.6 million had a formal water supply. Half the urban population had piped water, while 56% of the rural sector was provided with either piped water, protected wells or deep wells equipped with hand-pumps.

The achievements at the end of the Decade are impressive. By 1990, 66% of the total population of 17.6 million, comprising 76% of the urban sector and 64% of the rural sector, had access to relatively safe water, and this represents the extension of facilities to 4.6 million more people. Sri Lanka has now set itself the ambitious task of providing 100% coverage of the population with safe water by the year 2000.

The strategy of providing safe water to towns is in theory simple, the answer being piped water as in any other country. But as the cost is enormous, the scheme will have to be spread over several years. On the other hand, the large mass of rural folk living in scattered communities and under different climatic conditions poses a different challenge. It requires a multi-pronged approach which, according to circumstance, should consist of piped water to small townships, deep wells mostly in the dry zone, and protected shallow wells elsewhere.

Tube wells, drilled to a depth of 75 to 100 metres and equipped with a hand pump, provide safe water of good quality and taste. This programme has now set up 12 000 units, each costing about US$ 1500. Tapping the deep subterranean sources, they have been of immense benefit to the people. A pleasing spectacle that confronts the traveller is that of a group of women gathered round a tube well in the midst of a parched land, each waiting patiently for her turn to fill her earthenware pot.

Deep wells now serve a population of 1.2 million, and it is proposed to increase the coverage to another one million by the year 2000. When the last census was taken in 1981, deep wells were not a significant source of water.

But the main thrust of the rural programme is on building conventional shallow wells, a source of supply even in ancient times. The remains of an eleventh-century well have been discovered in an ancient human habitation. It was lined with cylinders made of baked clay and placed one above the other in layers.

Water from a shallow well is considered safe if it is protected by an adequate perimeter wall, has a drainage apron on a well-compacted base, and is fitted with a fixed rope and bucket to discourage the use of individual vessels. In 1990, protected wells served a population of 6.5 million.

Unsafe water

In 1990, five million people obtained water from unsatisfactory sources, such as unprotected open wells, tanks, rivers and springs. Natural springs are crystal clear in the upper reaches, but after exposure to human settlements downstream they lose their sparkle. In some instances the water is led to where it is needed via an aqueduct improvised with longitudinally split trunks of palm trees, offering the picturesque sight of people bathing under a cascade of water at the end of the aqueduct.

Regular advice is given to the public through the media on the importance of boiling water before drinking. In a country whose literacy rate in 1981 was 87.2%, people are generally receptive to this advice, but one constraint is the high cost of fuel.

The dedication of the Decade to both drinking-water and sanitation underlines the complementary roles that each plays in the health of the people. In the 1981 census, 70% of the occupied housing units or 48% of the population had access to some formal means of excreta disposal. The estimated figure at the end of the Decade was 58% of the population.

Historically, cholera was the most important water-borne disease in Sri Lanka. In the late 19th century,

frequent epidemics took a heavy toll. But the disease was never endemic in the country, and was not permitted to take root. It was especially common along the old migrant labour routes, where it spread through contaminated water in tanks and wells. There was a dramatic fall in incidence in Kandy and Colombo after a piped water supply was introduced in those towns in 1878 and 1894 respectively. In recent times there have been only sporadic cases.

An attack on all fronts

As in many other less industrialized tropical countries, there is a high incidence of diseases resulting from poor environmental conditions. While the quality of water is an important determinant, other issues such as sanitation, immunization and primary health care also must be addressed if a dent is to be made in their incidence or in the mortality they cause. In Sri Lanka, an attack on all fronts has produced a favourable outcome.

The incidence of diarrhoeal diseases varies throughout the year but still remains unacceptably high at 802 cases per 100 000 population. On the other hand, only 0.4% of them died in 1991, a dramatic reduction from 1.3% in 1981. Poliomyelitis has been virtually eradicated, mainly through immunization; there were only four cases in the whole country in 1991. As for typhoid and paratyphoid, there was a time in the 1950s when entire sections of hospital wards were reserved for them. Now the picture has changed drastically, and the incidence was only 25 cases per 100 000 population in 1991.

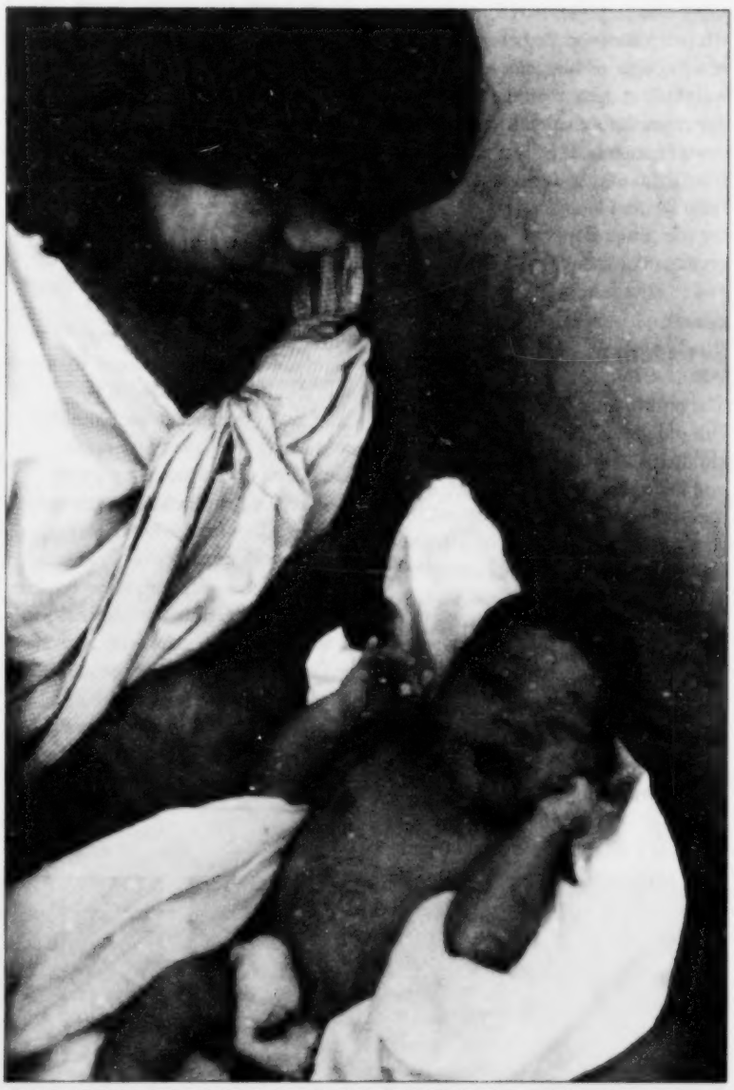
The profile of water-related diseases is encouraging, but obviously there is much room for improvement. It is hoped that the achievement of the goal of "water for all by the year 2000" will have the desired impact on these diseases. ■

Dr Christopher Gunapala Uragoda is a consultant chest physician at the Chest Hospital, Welisara, Ragama, Sri Lanka; he is also co-editor of the Ceylon Medical Journal.

Healthy families make healthy babies

Elsa Margarita Moreno

The family constitutes the biological, cultural and social unit where "life-styles" develop; the pregnant woman needs the support of all the family members to give her baby the best possible start in life.



Sufficient weight at birth gives a child a healthy start in life

Low birth weight is one of the most serious public health problems in the world today. It is estimated that more than 20 million low-birth-weight children are born every year, more than 90% of them in the developing countries. These low-birth-weight babies – defined as infants born weighing less than 2500 grams in the first few hours of life – account for a high proportion of infant mortality. If they survive, they suffer higher rates of childhood illnesses and more or less permanent and severe disabling conditions, such as mental retardation, behavioural disorders, cerebral palsy, and impairment of vision and deafness.

For a long time all low-birth-weight babies were regarded as premature. We now know that there are two clearly distinct groups. The first comprises babies born before completion of the full 37 weeks of pregnancy; these should be described as "pre-term" and are the true premature babies. A second group, who are "small full-term babies," have completed the full gestation period but are born with low birth weight as a result of retarded intrauterine development, which may have several causes. This distinction is useful for designing control programmes and anticipating the child's later development.

Low birth weight is nearly always the result of socioeconomic, life-style or behavioural factors on the part of the mother and family. These factors are well known and include insufficient antenatal care, inadequate maternal nutrition, pregnancy at extreme ages or insufficient birth spacing, smoking, too much physical activity during pregnancy, psychosocial and occupational stress, and so forth.

The scale of the problem and the nature of the causes, many of which are deep-seated and therefore difficult to redress, clearly indicate that the answer must lie in a shared

commitment on the part of governments, communities and individuals. There have been instances where improving the coverage and quality of antenatal care and introducing programmes of supplementary nutrition for pregnant women have produced encouraging results, with visible gains in birth weight. But these measures, reflecting determined political will, must in all cases be matched by commitment from the community and especially from the family, since this is where the most important decisions bearing on maternal and child health are taken.

Birthplace of life-styles

The family is the biological and cultural unit comprising parents, children and relations, but also employees and other people living together under the same roof and sharing the same food. It is in this social unit that "life-styles" develop. This is where routine daily activities take place and habits are formed, such as the hours of waking and sleeping, dietary likes and dislikes, the number of meals taken each day, smoking, consumption of alcohol and other stimulants, physical exercise, use made of the health services and so on.

Some of the most important steps that can be taken by families to prevent low birth weight include:

1. **Good antenatal care. Among the most important aspects are to monitor the growth of the fetus, to treat infections and other diseases, and to take practical measures to prevent low birth weight.**

Antenatal control must be initiated early and maintained if it is to be effective. This means the mother should seek health care before the third month of pregnancy and continue to attend the clinic at the dates set by the health service, according to the degree of risk involved in the pregnancy. Very often this check-up is not carried out adequately because of such problems as distance, the cost of transport, having no one to look after small children or being unable to get away from work or household chores. This is where other members of the family must lend their support; it has been found that the more family members who help the pregnant woman to seek antenatal care, the more consultations she will attend.

This "family support network" can help in many different ways – for instance, discussions aimed at dispelling doubts or fears and taboos, advice on how to take care during pregnancy, or helping to pay for the cost of consultations.

2. **Better sharing of the family food so as to improve the expectant mother's diet.**

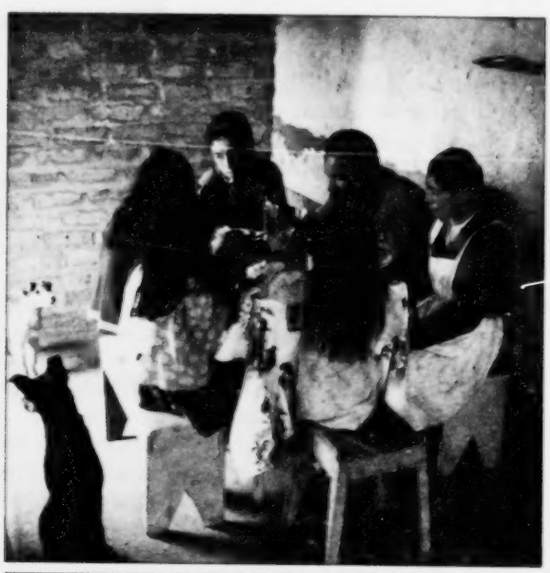
It is now recognized that the first cause of malnutrition is usually inadequate food intake, which is due to lack of purchasing power. Pregnant women have increased calorie and protein requirements; if these are not met, the baby's intrauterine development can be retarded, resulting in low birth weight.

Very often, for sociocultural and economic reasons, the woman's share of the food available within the family is not enough to meet her increased needs. These families must understand how vital it is to increase the pregnant woman's share.

3. **Ensure that pregnant women avoid heavy work, rest as much as possible and avoid stress.**

Many studies on occupational risks in women have shown that pregnant women who do heavy work put on less weight and have a higher percentage of low-birth-weight babies than women with a similar diet who are not subjected to excessive work.

A young woman listens to advice on family planning

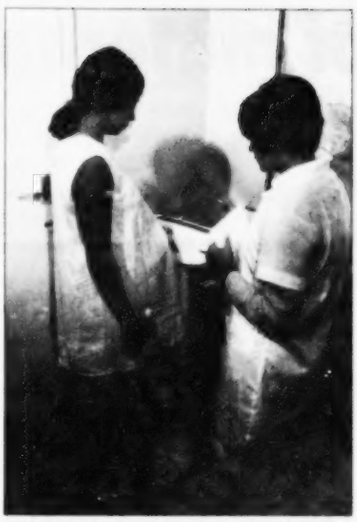


Equal access to food is of vital importance for women of all ages

In the developing world, women in the countryside take an active part in agriculture and animal husbandry, as well as having to cope with household work, look after the children, prepare food and fetch water and fuel. In the cities, where women are increasingly employed in the service and industry sectors, women often have to do a full day's work and then start the housework. To reduce the time and energy that pregnant women have to spend on work, the other members of the family, especially husbands and older children, must contribute to the housework even if this means breaking with patterns of behaviour that are very deep-rooted in most cultures.

4. Prevent adolescent pregnancy and ensure adequate birth spacing through family planning measures.

Babies born to teenage mothers more often weigh less than the norm. Birth weight usually increases with birth rank but after a large number of births – more than five – the chances of low birth weight are increased. In these cases, low birth weight can be attributed to the mother's poor nutritional status and to what has been called the "maternal exhaustion syndrome". This means that the intervals between births are too short, and do not give the mother enough time to replace the nutrients used in the previous pregnancy.



A regular check on the weight of the mother will ensure that her baby will be healthy.

A study carried out in the USA compared birth weights of infants born within a year of a previous full-term pregnancy with the birth weights of babies born after more than a year. The babies born after longer intervals had a much higher weight on average. In this study there were no socio-economic differences between the two groups, so the various findings can be attributed to biological factors.

Careful monitoring of the fetus's development.

5. Give up smoking during pregnancy.

Smoking involves deliberate and repeated exposure to a mixture of air and smoke containing more than 4000 different chemicals, at least 30 of which have been recognized as harmful to health. Epidemiological and laboratory studies, as well as direct observation, have provided definitive evidence that smoking increases the risk of fetal death and intrauterine damage, results in a higher percentage of low birth weight, and more often predisposes the mother to complications.

Babies born to mothers who smoke weigh as much as 420 grams less, on average, than babies born to nonsmokers. This weight differential is also related to the number of cigarettes smoked. It has been calculated that each additional day of smoking results in the loss of 10-20 grams in the baby's weight, usually because of retarded intrauterine development.

Living with smokers is also harmful for pregnant women, especially in enclosed environments. The mothers then become passive smokers and can absorb up to one-sixth of the smoke exhaled by another member of the family. The risk of fetal or neonatal death increases in proportion to maternal and environmental exposure. So it is not only important that the expectant mother should give up smoking, but that the whole household should become smoke-free. All the family must cooperate, realizing that it is not just a matter of the very legitimate rights of nonsmokers but the paramount right of the fetus not to be a passive smoker, whose life is threatened. It *is* possible to reduce or stop smoking during pregnancy if a concerted effort is made by all members of the family, in the spirit of a fervent wish to protect the child. ■

Professor Elsa Margarita Moreno, former Coordinator of the PAHO/WHO Maternal and Child Health Programme, is Professor of Public Health at the National University of Tucumán, Avenida Sarmiento 191, 4000 S.M. de Tucumán, Argentina.

Social cost of maternal deaths

Oratai Rauyajin & Bencha Yoddumnern-Attig

In countries with especially traditional societies, women whose biological function is to reproduce the species have a significant role in motherhood, and their social status is based on their abilities to fulfil this role. Generally, childbirth is a joyful event for a family and the community. Yet safe motherhood has long been neglected by policy-makers as an important prerequisite for national development. Consequently, many thousands of such mothers have been dying in developing countries.

As far back as 1942, Thailand's Ministry of Public Health was concerned about maternal mortality and established a Maternal and Child Health Division within its Health Department; this Division was later renamed the Family Health Division. Its main duty was to expand maternal and child health coverage over the entire country. The basic strategy was to train auxiliary midwives to staff a number of midwifery centres that would provide expanded services at the district level.

During the past decade, the Ministry has strengthened the maternal and child health services in order to achieve maximal coverage of both curative and preventive care at all levels. The programme focused on increasing community participation and involvement to increase service accessibility and acceptability. In line with WHO's Safe Motherhood Programme, the Ministry has launched many other programmes aimed at halving the present mortality rate by the year 2000, and carried out a pilot study for improving the services through the primary health care approach, targeting high-risk and special minority groups.

The impact of maternal mortality on the individual, the family and society at large is like a pebble dropped into a pond, where the ripples of action and reaction reach out to all shores. In Thailand, the problem is causing particular concern.

In terms of the country's developmental future, the maternal mortality rate is still high and is one of the leading causes of death. This is especially the case for women living in remote rural areas as well as among the minority Muslim population in southern Thailand. These mothers represent the vulnerable groups in need of immediate interventions, since they have the least access to services due to physical, social and cultural barriers.

Maternal mortality

A one-year nationwide survey of maternal mortality collected data in 1989-90 from medical records and death certificates about mothers who died in hospitals, clinics, health centres and other health service units run by the government and private organizations. Results showed that the nation's maternal mortality rate was 2.7 per 1000 live births, but this varied depending on the region under study. The highest rate was in the south (5.0 per 1000 live births) and the lowest in the central region (1.1 per 1000 live births). Most maternal deaths in the south came about because the mountainous terrain restricts access to government health services. Furthermore, certain traditional childbirth practices are inappropriate, and many mothers are attended by traditional birth attendants and had no antenatal care.

The social costs of maternal mortality are enormous, but they fall most harshly on a woman's traditional role of mother and on the children under care. An old Thai proverb reflects the consequences of maternal mortality. It says, "*Without a father, a child's life will be hard; it will have no direction. Without a mother, the situation is even worse – the same as a sinking boat or broken ferry.*"

Traditionally, a child whose mother died in childbirth was adopted by the mother's relatives. Older children (around 12 years of age) would care for themselves and any younger sisters and brothers. However, in times of need, a mother's kin group provided a secure base from which to tap needed resources. As a result, fostering arrangements and orphanages were not necessary.

In contemporary Thai society, however, low fertility has led to small family size, an increase in the number of nuclear families, and a reduction in the role of kin groups. The impact of maternal deaths, therefore, is greater today than in the past. Orphans have fewer people to turn to, and many must be cared for by society. Others enter the workforce early and earn their living as factory workers; still more become "street children". These youngsters are uneducated, homeless and are often forced to become beggars to eke out their living. To deal with their hardships, many turn to drugs, and this results in various types of social problems including increased juvenile crimes and prostitution.

AIDS orphans

This situation is worsening as Thailand comes under the grip of the AIDS epidemic. More women and children are becoming HIV-positive as the disease begins to afflict low-risk groups such as housewives and factory workers. For every pregnant woman who is HIV-positive, her child has a one-in-three chance of also contracting the disease. Those children who are afflicted will die within two to five years.

In large cities such as Chiang Mai in northern Thailand, where the HIV-positive and AIDS rates are high, concerted efforts are being made to address this problem. One method is to establish home care for HIV-positive and AIDS orphans. Instead of living in a hospital with its sterile, insensitive environment, such children without mothers are transferred to a home that provides better quality and more compassionate care. Without doubt, as maternal mortality increases from AIDS, this type of home will be in greater demand in the future.

Some orphans, who are not fortunate enough to receive home care, are often seen as a burden to their families. In a large Bangkok slum, about 35 to 40 orphans live among the spreading AIDS situation and other social problems brought on by overcrowded conditions and poverty. Fostering arrangements and orphanages are thus in growing demand.

So maternal mortality attacks the very heart of a family's future, not only in terms of child care but also of economics. Women make up about 69% of Thailand's labour force. Rates of premarital sex, pregnancy and abortion are also very high among this group, which places them at greater risk of contracting AIDS, transmitting it to their unborn child and later dying from the disease, only to leave another AIDS orphan in society's care. The future picture of maternal mortality in Thailand, therefore, is one of uncertainty, and will no doubt influence the nation's ability to expand and enter into the industrialized world.

The impact of maternal mortality on the individual, the family and society at large is like a pebble dropped into a pond, where the ripples of action and reaction reach out to all shores. In Thailand, the problem is causing particular concern. If a society does not have an adequate mechanism to manage or absorb the costs, and most importantly to care for the children involved, each person's and the society's quality of life will decline as will their health, livelihoods and the nation's developmental prospects. ■

Dr Orathai Rauyajin is Associate Professor in the Department of Social Sciences, Mahidol University, 25/25 Puthamontol 4, Salaya, Nakornchaisri, Nakornpathom 73170, Thailand, and Dr Bencha Yoddumnern-Attig is Associate Professor in the Institute for Population and Social Research at the same University.

Essential obstetrics ... an important means of preventing maternal deaths.

Environment and health

Rat race, 1993

Thomas Gray

Defending our food supplies by rat-proofing, sanitation and public hygiene is our best form of attack against the damage and disease caused by rats and other rodents.

Scavengers and carriers of disease

The rat is mankind's Number One four-legged enemy and probably the most astute. Rats and other rodents have pillaged our larders since the dawn of civilization and have brought diseases into human dwellings: sickness which could have been avoided if our towns and villages were free from them. This was the message driven home 26 years ago by *World Health* in an issue devoted to the rat problem. It still holds good today. Since 1967, when a WHO seminar brought together 30 scientists from 16 different countries and alerted the world to the danger, the patterns and sizes of rat populations have changed.

Today, the large-scale growth of urban rat colonies in industrialized countries is evident. At the same time, the rat menace in developing countries has not lessened, and may grow to match the ever-increasing urbanization in these regions. To control rodent infestations requires sanitation to reduce supplies of refuse and waste and the blocking of access to warehouses and granaries.

Regrettably, a new dish has appeared on the urban rat's menu during the past two decades: fast food. Last year, a British pest control officer pinpointed convenience meals as an important factor in accelerating the growth in rodent colonies. Miss Sandy Cox, who works in the northern English town of Accrington, estimated that the numbers of rats in her area had trebled in the past ten years. She attributed this population explosion to the easy meat available from discarded fast-food remnants and to public squalor. "Pizza-boxes and fish and chips littering the streets attract vermin from the sewers," she said.

Superbreeders

Similar population explosions are taking place in United States cities, where American rats are described as "superbreeders" by Dr James Childs, a researcher based at the Johns Hopkins Medical Center in Baltimore. He estimated that these urban rats produced an average of ten young, every six to seven weeks. Experts, quoted in the *World Health* issue on rats 26 years ago, estimated then that, in general, there was one rat to every single human being in the world, with higher proportions in some countries.

At that time American experts set the rat population at a "mere" 100 million. Today, according to Dr Childs' estimate, rats equal in numbers the current US human population of almost 249 million, which means that the American rat count may have exploded by 150% in a quarter-century. Moreover, today rats are probably better fed than ever before.

The two most common rats are the black *Rattus rattus* and the larger, brown, *Rattus norvegicus*. The black rat has the longer record as a disease vector, but as a plunderer of food supplies and an all-round economic menace, the brown rat overshadows his black competitor. They damage sewers, they chew through lead pipes and they have a special predilection for electric and telephone cables. They seem to have an irrepressible urge to chew up almost anything – due in part to the need to file down their incisors. These grow at a rate of 13 mm a year and, unless they are filed down, the rat dies.

The black rat carried the infamous plague which held western Europe by the throat in the Middle Ages and killed off scores of millions of people within five years. Centuries later, in the great Indian plague of 1896, ten million deaths were chronicled. Today, Indian government reports show that not a single case of plague has been recorded since 1967. However, WHO statistics (for 1990) reveal 1250 reported cases of plague from 12 countries. Although this most dangerous of the rat-borne diseases is no longer of pandemic dimensions, the threat remains.

Rats contribute to the spread of many other diseases, such as haemorrhagic fever with renal syndrome, rodent-reservoired leishmaniasis, scrub typhus and Lyme disease. Less common are trichinosis, caused by eating contaminated pork, and rat-bite fever, also known as *sodoku* – derived from the Japanese words *so* for rat and *doku* for poison. In China and other Asian countries where rice cultivation is common, farm workers are sometimes affected with leptospirosis because the paddy fields provide favourable conditions for rats/rodents and the transmission of leptospira. Leptospirosis may also be contracted by handling or eating food contaminated by rat's urine, and another rat-borne sickness is murine typhus, which can be serious in older sufferers.

Rodents: a source of infections

Rodents are the potential source of a number of infections to man and animals. They are the reservoirs of the following:

- Bacterial zoonoses such as leptospirosis, rat-bite fever due to *Spirillum*, plague, salmonellosis, yersiniosis, melioidosis, tularaemia, and Lyme disease.
- Rickettsial zoonoses such as rickettsial pox (due to *R. akari*), Siberian tick typhus (*R. sibirica*), and flea-borne typhus (*R. typhi*).
- Viral zoonoses such as Venezuelan equine encephalitis, haemorrhagic fever with renal syndrome, Argentinian haemorrhagic fever, lymphocytic choriomeningitis, and Lassa fever.
- Parasitic zoonoses such as leishmaniasis, schistosomiasis, echinococcosis due to *E. multilocularis*, trichinelliasis, toxoplasmosis, and angiostrongyliasis.
- Mycotic zoonoses such as histoplasmosis.

Food stocks destroyed

In many famine-stricken areas of the world, rat-pollution of food supplies can mean the difference between starvation and bare adequacy for millions of people, especially refugees. In the Sudd region of

A crafty and unseen enemy

which jeopardizes the economy of poor countries

Africa's largest country, Sudan, valuable seeds and grain stores in settlements near the unfinished Jonglei Canal are regularly plundered by rats and other rodents, thus destroying the efforts by displaced peasant farmers to survive the rigours of climate and conflict. In Indonesia, Balinese rice cultivators protect their crops from rats with particular vigour: rice is seen as having both a sacred as well as a food value.

One single rat left free to roam a warehouse for one year will, it is estimated, eat about 27 pounds of food and deposit 25 000 droppings to spoil much more. But when rats have to compete fiercely among themselves for reduced food supplies, they thin their own ranks. Consequently, defence by rat-proofing, sanitation and public hygiene is our best form of attack.

One American writer describes a healthy rat as "untrusting, conservative and suspicious". Researchers in animal behaviour also point to the rat's "neophobia" or fear of the new; they are averse to anything unfamiliar in their environment. Such items would, of course, include poisoned bait. Moreover, our wily enemy has been known to have developed a resistance to certain types of poison. These factors reinforce the need to safeguard food supplies as a major and safe weapon in the fight against the rat.

This age-old battle with the rat and other rodents must go on; many national bodies and organizations approach their problems along the lines advanced by WHO and are speeding the day when the rat can no longer bring disease, famine and death to mankind. ■

Mr Thomas Gray is a biologist who has worked with UN agencies as an educational expert. Long-term readers of World Health may remember his contributions to the April 1967 issue. His address is 2 Dunfield Road, Bellingham, London SE6, England.

Damage to food

Rodents, particularly rats and mice, are very destructive and cause tremendous damage to the food supply by consuming a considerable

Eliminating mice and rats with cyanide in Thailand

Farmers attending a demonstration on rodent control in Pakistan

quantity of our field crops, particularly rice, but also wheat, maize, sorghum, millet, palm oil, coconuts, groundnuts, cocoa, sugar cane and vegetables. Estimated losses of food crops due to damage by rodents vary from about 5% to 50%. Stored food products are also vulnerable, such as maize, rice, sorghum, millet, barley, oats, wheat, and cereal products like flour, maize meal and semolina. Oilseeds and oilseed cakes as well as mustard and sunflower seeds, sesame, coconut and copra are also in danger. In some areas, pulses and root crops such as potatoes, yams and onions are also damaged. Miscellaneous food items such as powdered milk, cocoa beans, bread and sugar are also consumed by rodents. On a worldwide basis some 33 million tons of bread grains and rice in storage are reckoned to be lost owing to rodents each year. Occasionally, rats (*Rattus norvegicus*) may be found in slaughterhouses where they consume meat stored in cold chambers.

In addition, rats and mice foul a considerable amount of the food supplies with their faeces, urine, saliva and hair, rendering them unfit for human consumption. House mice, by nibbling and then discarding partially-eaten foods, destroy considerably more than they actually consume. Rodents also gnaw holes in food containers, e.g. jute bags, and the resulting economic loss is considerable.

Rodents also play an important role in the transmission of foodborne diseases to humans. They are carriers/reservoirs of food-and waterborne pathogens such as *Salmonella* and Lassa fever virus, and can contaminate food with these pathogens through their excreta. In addition, rats are hosts of such parasites as *Trichinella spiralis* and *Angiostrongylus* species. Pigs, by eating *Trichinella*-infected rats, acquire the infection; man is infected through eating raw or undercooked pork meat infested with larvae of trichinella. Similarly, larvae of *Angiostrongylus* excreted by rats are ingested by snails or aquatic animals such as crustaceans and fish. Man is subsequently infected after ingestion of raw or undercooked snails, crustaceans and fish, as well as raw vegetables contaminated with sludge.

Rats and mice breed rapidly, and the problems that they cause are worldwide. However, their damage to the food supply is more acute in the tropical and subtropical, developing countries, in many of which the people's nutrition is already inadequate. ■

Adapted from Vector Control Series: Rodents – training and information guide, 1987 *(WHO document WHO/VBC/87.949), obtainable from the Division of Control of Tropical Diseases, WHO, 1211 Geneva 27, and from information provided by the Food and Agriculture Organization of the United Nations, Rome.*

An Indian farmer applies a water-based fumigant to a rathole in the wall of a granstore.

WHO has published a kit containing a range of materials to support a do-it-yourself, community approach to the control of insects and rodent pests. *Insect and rodent control through environmental management* can be ordered from Distribution and Sales, WHO, 1211 Geneva 27, Switzerland; Price Sw.fr.90 or US$ 81; in developing countries, Sw.fr.63.

Note to the readers

Mr Frank Hartvelt, author of the article on the Children's Vaccine Initiative (CVI) on page 4 of our March–April issue, wishes to point out that the editors omitted his description of the Task Forces dealing with strategic issues and the discussion of the symbiotic partnership between the private and public sector companies. ■

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In the next issue

Tuberculosis had slipped into the background 20 years ago. It now returns with a vengeance and is today the leading cause of death from a single infectious disease, killing three million people a year. The July-August issue of **World Health** looks at different aspects of this silent disaster, including its deadly link with AIDS. ■

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